

We Claim:

1. A method for transmitting data from a first router device, connected to a communications network through a network gateway unit, through the communications network to a second router device, which comprises:

providing a hardware address according to a routing protocol used to identify a second router device located downstream with respect to a data path leading to a transmission destination;

allocating the hardware address to data to be transmitted with the first router device dependent upon the transmission destination of the data;

transmitting the hardware address and the data from the first router device to the network gateway unit;

checking, with the network gateway unit, whether or not the transmitted hardware address matches a hardware address stored in a memory of the network gateway unit and, in the event of a positive check result:

allocating a network address to the data with the network gateway unit, the network address being allocated to the transmitted hardware address in the network gateway unit

and identifying an exit point of the communications network;

forwarding the network address and the data from the network gateway unit into the communications network after conversion according to a transmission protocol used in the communications network; and

transmitting the data from the communications network to the exit point defined by the network address, the exit point being where the data is fed to the second router device.

2. The method according to claim 1, which further comprises:

connecting the second router device through a second network gateway unit as an exit point to the communications network;

allocating a hardware address identifying the second router device to the data with the second network gateway unit; and

transmitting the data from the second network gateway unit to the second router device.

3. The method according to claim 1, which further comprises:

connecting the second router device through a second network gateway unit as the exit point to the communications network;

allocating the hardware address identifying the second router device to the data with the second network gateway unit; and

transmitting the data from the second network gateway unit to the second router device.

4. The method according to claim 1, which further comprises

connecting the second router device to the communications network as the exit point identified by the network address; and

receiving the data from the communications network with the second router device.

5. The method according to claim 1, which further comprises:

connecting a first local area network to the first router device;

connecting a second local area network to second router device; and

transmitting the data:

from the first local area network through the first router device to the second router device; and

from the second router device into the second local area network.

6. The method according to claim 1, which further comprises:

storing, in an allocation table, hardware addresses identifying router devices, the hardware addresses being respectively allocated to one of network addresses; and

allocating the network address to the transmitted hardware address in the network gateway unit using the allocation table.

7. The method according to claim 6, which further comprises storing an IP address of a router device identified by the respective one of the hardware addresses in the allocation table, the respective one of the hardware addresses being allocated to a hardware address stored in the allocation table and provided for identification of the router device.

8. The method according to claim 7, which further comprises:

answering, with the network gateway unit, an inquiry of the first router device relating to a hardware address of a router device identified by an IP address contained in the inquiry; and

transmitting the hardware address allocated to the relevant IP address in the allocation table from the network gateway unit to the first router device.

9. The method according to claim 1, wherein the hardware address is a medium access control address.

10. The method according to claim 1, which further comprises transmitting the data in the communications network through preexisting connections.

11. The method according to claim 1, which further comprises transmitting the data in the communications network through connections set up on demand.

12. In a communications system having router devices, a first of the router devices being connected to a communications network through a network gateway unit, the communications network utilizing a transmission protocol, the network gateway unit transmitting data from a first router device through the

communications network to another one of the router devices,
the network gateway unit comprising:

an allocation table for storing hardware addresses each
respectively allocated to a network address and identifying an
exit point of the communications network to a relevant one of
the router devices, the first router device using the hardware
addresses to identify another one of the router devices;

an address-checking device determining if a hardware address
arriving from the first router device matches one of the
hardware addresses in said allocation table, said address-
checking device connected to said allocation table;

an address allocation device allocating data arriving from the
first router device, the data being allocated to a respective
one of the hardware addresses, to a network address allocated
to the respective one of the hardware addresses in said
allocation table, said address allocation device connected to
said allocation table; and

a protocol conversion device converting and transmitting the
data arriving from the first router device according to the
transmission protocol, the network address allocated to the
data being used as address information, said protocol

conversion device connected to said address-checking device
and to said address allocation device.

13. The network gateway unit according to claim 12, wherein:

each of the router devices has an IP address; and

an IP address of one of the router devices identified by a
relevant hardware address is allocated in said allocation
table to one of the hardware addresses recorded in said
allocation table.

14. The network gateway unit according to claim 13, wherein:

the first router device sends inquiries including a given IP
address, the inquiries each relating to a hardware address of
one of the router devices identified by the given IP address;
and

an address resolution device:

answers the inquiries from the first router device by
searching for the respective one of the hardware
addresses allocated to the given IP address in said
allocation table; and

transmits the respective one of the hardware addresses to the first router device.

15. The network gateway unit according to claim 12, including an entry device for entering address information into said allocation table, said entry device connected to said allocation table.

16. The network gateway unit according to claim 12, including a means for entering address information into said allocation table, said entry means connected to said allocation table.

17. The network gateway unit according to claim 12, wherein the communications network is an asynchronous transfer mode network.